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ARTICLE I. *On the Typhus Fever which occurred at Philadelphia in the spring and summer of 1836.* By W. W. GERHARD, M. D., one of the Physicians of the Philadelphia Hospital, Blockley. [Part second.]

The cases published in the first part of this memoir (see this Journal for February, 1837) are sufficient to illustrate the leading facts of the pathological anatomy of this form of fever.

The glands of Peyer were found not merely free from the peculiar lesion occurring in dothineritis or typhoid fever, but these follicles and the rest of the intestine were more healthy in the petechial fever than in the majority of other diseases. We are the more certain of the state of these glands because our attention was closely directed to this subject, and we had previously made most numerous examinations of the glands in typhoid fever and in other diseases; we could therefore pronounce with certainty as to their actual condition. The mesenteric glands were always either normal or very little injected; and the spleen was altered only in one third of the whole number of patients.

The lesions of other organs were as various as they are in most acute diseases, and evidently depended in a great degree upon the season, or upon the accidental circumstances in which the patient was placed. Thus, we had several cases of pneumonia in the months of March and April, while the lesions of the intestine were remarkably insignificant. But in the warmer season of June, July and

August, diarrhoea was frequent, and was accompanied not by a lesion of the glands of Peyer, but by softening or other affections of the mucous coat of the colon.

The pathological anatomy of a disease will usually afford us useful data which may point out the analogies which unite it with other maladies. Now the absence of a permanent characteristic lesion, at least in the solids of the body, is one of the most remarkable peculiarities of the exanthemata. In all these diseases there is no constant lesion, with the exception of the eruption itself. The analogy is not limited to the pathological anatomy, as the subsequent part of this memoir will prove; and without wishing to lay too much stress upon the resemblances which may exist in some of the symptoms of a disease which presents a strong analogy, we cannot pass them by without due attention. As far, therefore, as the pathological anatomy will direct us, we are constrained to class typhus fever amongst the exanthemata. We shall presently examine the relations which the symptoms may bear to those of other diseases.

In the account which we shall give of the symptoms of the epidemic of typhus, it is not our intention to subject them all to a rigid numerical analysis. We shall describe the symptoms, but enumerate those only which are sufficiently important to render the diagnosis between this fever and dothineritis precise. It should, however, be remembered that the symptoms which are stated without an exact arithmetical estimate of their relative frequency, were all carefully noted and examined attentively, one by one. There can, therefore, be little danger of any inaccuracy in the estimate given of their relative frequency, and still less of incorrectness in their description.

Exterior. An eruption of a peculiar character appeared on the skin of 32 out of 36 whites, in whom it was noted. Of the four cases in which it was not visible, one died upon the seventh day of the disease, and the others presented slight symptoms of fever, which disappeared in the course of four or five days. It was also visible, though less distinctly, in mulattoes; and we may infer that the colour of the skin alone prevented its developement in the negroes. It consisted of petechiæ, which in not more than six cases resembled the rose-coloured spots of dothineritis. The petechiæ assumed the form of small reddish or purple spots from the breadth of one line, or even the eighth of an inch, down to that of a minute point. They were not elevated above the surface of the skin, and were without the regular round or oval shape of the rose-coloured spots. The colour of the petechiæ at first was of a lighter red, and could with difficulty be distinguished from the spots of typhoid fever; but on the second

or third day they assumed the dull red or purple colour of the eruption proper to the typhus; sometimes they were nearly black.

The eruption of petechiæ must therefore be regarded as a characteristic symptom, for it was present in nearly every case in which the symptom was sought for. The eruption is indeed quite as constant as that of measles or small pox; for those cases in which it could not be detected either died before the day on which it usually appeared, or were ephemeral, abortive cases of the disease, which ceased before passing through its regular periods. The petechiæ appeared from the sixth to the eighth day, after the beginning of the symptoms, and disappeared from the fourteenth to the twentieth day. But the time of their disappearance varied much, and the gradual diminution of their colour rendered it difficult for us to indicate its precise date. The eruption would occasionally fade without entirely disappearing, and again resume its former colour. This sudden and unexpected fading of the eruption coincided with a depression of strength, and was often of fatal prognosis. After death, a slight bluish ecchymosis, easily traced in the thickness of the true skin, indicated the place of the larger petechiæ, while the smaller were no longer visible. The regular progress of the eruption proves the close analogy which exists between typhus and some of the eruptive diseases, especially scarlatina and measles.

There is a marked difference between the petechial eruption and the rose-coloured spots of typhoid fever. In typhoid fever the eruption is rare, very seldom extending beyond the abdomen and thorax; whereas in the epidemic typhus, the eruption is almost always general, extending to the limbs as well as the trunk. Whether the two eruptions are occasionally found together in the same individual, I cannot state positively. Besides, in typhoid fevers the reddish or rosy hue of the spots remains, and they are scarcely ever of the dull livid or purple tint of the petechiæ of typhus. It is certain that in a few cases the larger petechiæ resembled rose-coloured spots so closely, that without much care they might have been confounded with them.

The eruption of sudamina, or minute transparent vesicles about the groins and neck was also observed, but more rarely than the petechiæ. It was not so frequent as in typhoid fever.

The skin in whites presented other changes than those which have been mentioned. A constant symptom observed in every case was a dull, livid, red hue of the countenance, extending nearly over its whole surface; sometimes this colour approached a purple. It coincided with a strong dark red suffusion of the capillary vessels of the conjunctivæ which appeared at the same time with it, but usually dis-

appeared at an earlier stage than the injection of the eyes. The conjunctiva never presented the bright red tinge or the brilliant aspect observed in acute inflammatory diseases of the brain, or of the eye itself. The expression was dull, and the blood-vessels had a dark red tinge, instead of their usual scarlet hue. The suffusion of the face and eyes was so constant and so well marked in the fully formed disease, that it served almost as a pathognomonic sign. It was generally most evident with patients of a full habit of body. Towards the close of the disease, the reddish colour was gradually changed into a dull ashen tint, which remained until the entire recovery of the patient.

Emaciation did not take place in the early stages, it was indeed not very visible until the fever began to decline. If the other symptoms continued without increased severity, the wasting away of the flesh under such circumstances was generally a favourable sign, and indicated approaching convalescence. Stout, corpulent persons generally suffered more than those who were of a spare habit of body, and more frequently perished; and in a large majority of our dissections we therefore found the fat extremely abundant.

The *strength* of the patients failed in a great degree, nearly from the beginning. Thus, the man whose case is alluded to in the first part of this article, evidently lost his strength from the very moment of the attack, which seemed to arise from strict contagion. Other patients were able to walk about, but none were able to attend to their usual business except with extreme difficulty, and only in the earliest stage of the disease. But this prostration of the early stage was never so intense as that which comes on at a later period, when the fever begins to subside. The secondary prostration is of a more severe character, and is distinguished from the temporary loss of strength occurring at the beginning of the disease, by the coldness of the extremities, and the weak, fluttering pulse which usually attend it. In itself, the loss of strength at this stage indicates the subsidence of the fever, and is not a sign of bad import; but it must be watched, and if it advances too far, it often proves destructive to the patient. This second period of prostration, was in general easily combated by appropriate treatment.

The *cerebral symptoms* were certainly amongst the most characteristic of the typhus fever. They appeared very early in the disease and continued with greater or less intensity throughout its whole course. We shall examine them separately.

Stupor. About the same time with the prostration of strength, there was more or less stupor observed. It was perceptible in our

patients from the moment when they complained of their first symptoms. It was frequently slight, but could always be recognised by a little attention, and gradually increased until the middle period of the disease, when it was most intense; nor did it cease entirely until the strength of the patient returned. There were usually some traces of it during the convalescence. The stupor rarely passed into complete coma, except in fatal cases; hence coma was always a most unfavourable sign. Still, to a moderate extent, it was occasionally witnessed without being followed by the same danger as in ordinary diseases.

Vertigo and confusion of sight was also one of the first symptoms: thus in most cases in which they were noted, they occurred on the first day, and in the others very near the beginning of the disease. The same symptom exists in the dothineritis, but in a less constant and less severe degree. In the typhus fever it appears so early, and is so well marked, as to impress a peculiar appearance upon the physiognomy of the patient.

Tinnitus aurium, generally combined with partial deafness, is also very constant. Sometimes it is confined to one ear, but usually extends to both. The deafness is much more intense than in typhoid fever, but it may still be dissipated for a time by addressing the patient in a loud tone of voice. Some ringing of the ears and a slight vertigo frequently remain after the other symptoms of the disease are completely removed.

The *sleep* was in the early stages uniformly disturbed, although the patient lay almost constantly in a state of somnolence. Still it was not a sound sleep, nor did this take place until the patient either recovered or sank into a profound state of stupor. As in dothineritis there was somnolence, but nearly complete absence of refreshing sleep.

The *intelligence* was impaired from the earliest stages. At first the alteration was so slight as to escape the attention of an inexperienced observer, but when the fever had fully set in there was at least confusion of the intellect, and nearly always delirium. This last symptom was absent only in a few cases. The delirium was not noisy, except in about one patient out of twenty. In the immense majority of patients it was dull, muttering and incoherent. The delirium became more tranquil, and was exchanged for ordinary stupor or coma, when the fever was at its height. It did not cease entirely until the complete establishment of convalescence. Even after recovery the intellect of the patient was more enfeebled than it is in ordinary diseases, and regained its usual strength but slowly.

The *nervous symptoms*, which are usually considered by the French

writers as belonging to the ataxic form of dothiuenteritis, were present in a greater or less degree in every patient who survived the first two or three days after the attack. Those who perished thus early, died of the mere depression and the accompanying stupor; but from the third to the seventh day, various disorders of the nervous functions manifested themselves. These symptoms were the following:—The *sensibility* of the skin was universally augmented when the stupor was not so great as to render the patient insensible, or nearly so, to all external impressions. The tenderness, upon pressure, was so much increased as to induce us to refer the external soreness at the epigastrium, when pressure was made upon the abdomen, to an affection of the internal organs; but on more careful examination the sensibility was nearly equally increased in every part of the body, and was evidently external. The cutaneous tenderness was preceded by muscular soreness, which lessened as the skin became more sensitive.

In no case did we detect paralysis previously to the approach of coma; if it seemed to exist, we soon ascertained that it was only apparent, and caused by the extreme prostration.

Subsultus of the tendons at the wrist was observed in three cases out of four; in the more severe cases the subsultus extended to the muscles of the legs and face. When it appeared at the face, the corners of the mouth were drawn rapidly to one side or the other, giving a singular expression to the countenance. In the worst cases the subsultus extended to nearly all the muscles of the body, keeping the patient in a constant state of tremor, not unlike a severe chill. Such cases were not necessarily fatal, although the sign was of bad import, but of vastly less importance than in typhoid fever. The spasmodic contractions of the muscles were not permanent; hence there was no constant rigidity observed in any case. The smaller muscles were much more affected than the larger ones.

Abdominal symptoms.—In the ordinary typhoid fever of France, the symptoms connected with the alimentary canal are amongst the earliest and most prominent in the disease. The diarrhœa is constant, and occurs amongst the first symptoms; its intensity bears a tolerably exact, but not an invariable, relation to the extent of alteration in the intestinal follicles. As the lesion of the follicles is so constantly present, it is considered by most authors as the cause of the diarrhœa, although this symptom partly depends upon the irritation of the large intestine. In the epidemic of typhus, the intestines were found remarkably free from disease of any kind, except towards its conclusion, when diarrhœa became a frequent symptom. It did not, however, appear until the middle of summer, when the weather became hot and

dysentery was very prevalent. From the epidemic of dysentery which then existed, and the absence of any distinct and constant anatomical lesion, we were led to infer that the diarrhœa was an accidental, instead of a permanent symptom. In short, that it was by no means characteristic of the fever, but that it might appear as a symptom, just as it often does in pneumonia and other febrile diseases. Patients never seemed to perish from the severity of the diarrhœa, which was in general quickly and readily checked.

The *appetite* was generally destroyed in the advanced stages of the disease, and in whites it disappeared from the beginning. If they took food, it was mechanically, because it was offered to them, and evidently not from a desire of eating. The blacks, on the other hand, did not lose their appetite so universally; some asked for solid food, and ate the usual quantity of it. As the symptoms of anorexia was then far from constant, it is obviously less important than it is in typhoid fever, where it constitutes one of the earliest and most important phenomena. Nausea or vomiting was extremely rare, so that I scarcely find either of these symptoms noted in a single case. The thirst was great; it was intense in bad cases, when the patients retained sufficient consciousness to desire drink, and only lost by the supervention of entire coma. In convalescence it gradually ceased.

The *conformation of the abdomen* presented every possible variety. In the greater number, it was slightly tympanitic, but in many patients it was either retracted, or altogether of the natural form. The degree of sensibility of the abdomen was generally very doubtful, as the extreme tenderness of the skin gave rise to so much inconvenience that the patient confounded the pain which was seated in the viscera with that which was confined to their cutaneous covering.

The *urine* was examined very attentively, and was remarkable merely for its extraordinary freedom from brick-red deposit, or the changes so frequently observed during the course of fever.

The *thoracic symptoms* were of two kinds; those which were almost essential to the disease and rarely absent, and others which were accidental and frequently wanting during its whole course. In the earliest stage of this disease, although the respiration was usually remarkably vesicular in the whole anterior part of the chest, it was feeble and imperfect at the posterior part. This feebleness was accompanied by a dull sound on percussion, and was shown by our dissections to depend upon the engorgement of the lungs, which appeared very early in the disease; it was frequently combined with a subcrepitant or mucous rhonchus. The latter symptom was by no means constant, and was always vastly more frequent in the earlier cases

which occurred in the winter than in those which were admitted in the summer, towards the close of the epidemic. The engorgement ceased at the same period that the dark, livid, red tinge of the face disappeared, and was apparently owing to similar causes. The sibilant rhonchus which is usually present in dothineritis was rare in the typhus. Pneumonia was the most frequent accidental lesion, more frequent in winter than summer, and differed from the ordinary pneumonia merely in the greater abundance of loose mucous rhonchus and the slight development of bronchial respiration, and of fine crepitas; it was also rarely attended with pain. In many cases there was no pneumonia, although the bronchial tubes were evidently inflamed, and the respiration offered the characteristic rhonchi of bronchitis. This last affection was most prevalent in the colder weather, when epidemic catarrh chanced to prevail. It was the converse of the dysentery which affected the patients attacked during the warm weather. During the prevalence of influenza, the bronchitis sometimes appeared as the first symptom, and rendered the diagnosis for a time extremely obscure. Nor did it become clear, until the cerebral symptoms were developed, and the stupor and injected eye showed that the disease was of a more serious character.

Phthisis, in one case, began during the course of the fever, and rapidly ran through its stages; but it was much less frequent after typhus than dothineritis. In the case alluded to, the patient was a young man of slender frame, and probably already bore the seeds of the tubercular disease. When phthisis existed previously to the typhus, the influence of the latter upon the course of the former disease, was extremely doubtful, unless the case had been already advanced. A few tuberculous patients sank under typhus in a day or two after the attack; but in general they seemed more exempt from it than other individuals, as was proved by the small number of tuberculous subjects found amongst those dead of the fever, (not exceeding one in ten,) and by the comparative exemption of our consumptive patients from the effects of the contagion. Although the fever patients were placed in the same ward with those affected with phthisis, the instances in which it appeared amongst them were extremely few in number. This comparative exemption was rendered the more evident, as a considerable number of patients affected with diseases of the brain or the heart became victims of the disease. We even believed that the diseases of the brain (as paralysis from previous hæmorrhage) evidently favoured the development of typhus.

The action of the *heart* was remarkably feeble, although the extent in which its shock was felt did not seem less great than in health. This

diminished action of the heart is mentioned by many writers on typhoid fever, and is very nearly a constant symptom. It was of course greatest when the pulsation at the wrist was feeble, and easily compressed. In patients already exhausted by a previous disease, the feebleness of the heart and the pulse was extreme from the earliest period of the disease, and sometimes constituted the most prominent symptom. These cases were generally fatal.

The *pulse* was usually more frequent than in typhoid fever. Of thirty cases which terminated in recovery, taken at hazard from the whole mass of observations, the pulse ranged from 70 to 140 in the minute. The pulse was always noted in the morning, and occasionally in the evening, so that the average was a little lower than if it had been always counted several times in a day. Of these patients the maximum frequency of the pulse was less than 100 in the minute in four cases, from 100 to 110 in six cases, 110 to 120 in eleven, and 120 and upwards in nine.

Of ten cases taken also without selection and terminating fatally, the pulse varied from 68 to 150. But one patient, however, presented a pulse less frequent than 90 in the minute; and that patient, whose pulse was at 68, died two or three days after the attack, before the fever was completely developed. That rapid course occurred in one already exhausted by protracted chronic disease. The maximum frequency was less than 100 in one patient, from 110 to 120 in another; but in the eight others, that is, four-fifths of the whole number, it was above 120. We may therefore consider a pulse of more than 120 in the morning as an unfavourable sign, though of course not necessarily of fatal import.

The evening exacerbation was well marked, and coincided with increased heat of skin. The pulse was sometimes slow: when the skin was cool and the patient extremely exhausted, this slowness indicated a depressed circulation, and was usually a fatal sign. But in general the circulation was equable and the pulse frequent. The fever was distinctly continued, but with an evening exacerbation. In a large majority of our patients the pulse was very easily compressed, and in most cases it was decidedly feeble, at least in the advanced stages at which our early cases were admitted. In some patients it was full, but soft and compressible from the beginning. In a few, where some local inflammation was present, the pulse approached in character that of ordinary inflammatory diseases. The peculiar undulation in the motion of the artery, which is so frequent in typhoid fever, was rare in the typhus. When the fever abated the pulse sank very rapidly, and during the state of collapse attending

the beginning of convalescence, remained extremely feeble. When death approached it was also feeble, but it did not sink so suddenly or so rapidly.

The *temperature* of the body was elevated above the natural standard, as in other febrile diseases; still it offered some peculiarities which were more marked in this fever than in others of analogous appearance. Instead of the warm but frequently moist surface of the body attendant upon dothinenteritis, we observed a dry skin, which gave to the hand the peculiar pungent sensation frequently alluded to by writers, and termed "*calor mordicans*." This pungent heat was so remarkable, that the resident physicians and others would frequently diagnosticate the disease from this symptom only. There was occasionally perspiration, but this was rare, and never abundant, until convalescence approached. The heat of the skin declined towards the termination of the disease; and instead of subsiding merely to the natural standard, it evidently sank below it. This coolness of the surface coincided with the feebleness of the pulse, and required a supporting treatment.

There was another symptom closely connected with the skin. It was the peculiar *odour* from the body of the patients. This was pungent, ammoniacal, and offensive in the most severe cases; especially in fat, plethoric individuals: in some cases its smell resembled that of putrid animal matter, and remained so a few days before death. The patients who exhaled the odour in the strongest degree were observed to communicate the disease by direct contagion more quickly than others. In the cases of several of the nurses, there could be no doubt of the direct transmission of the disease from the person of these offensive patients. The bodies of these individuals putrefied very rapidly after death, but before putrefaction was completely established the odour was rather less pungent than it was during life. Cases of this kind are to be classed amongst those which procured for these forms of fever the appellation of putrid.

The *blood* drawn from patients affected with typhus fever has always attracted much attention. Even in dothinenteritis, it is more altered from its natural appearance than it is in most diseases; but in the petechial typhus, the change of aspect is still greater. We examined it in various stages of the disease, except those only in which the prostration was so considerable as to render blood-letting obviously improper. At a very early period it was dark, without the buffy coat, and offered a large, but soft and dark coloured, coagulum. At a more advanced stage, it presented in some patients the dissolved appearance described by various authors as characteristic of the typhus

or putrid fevers. When this dissolved state of the blood occurred, the patients were feeble, and did not bear the loss of more than two or three ounces of blood without fainting. Notwithstanding this state of the blood, only three or four patients in a hundred presented the sloughs and ulcerations about the sacrum and trochanters which are so common in dothineritis or nervous fever. Perhaps this absence of the sloughs was owing to the shorter duration of the typhus—at least, the fact is curious. Vibices, or large purple spots, were not recorded in more than two or three cases. Of course they could not have been discovered in the blacks; but at any rate, from the small proportion occurring amongst the whites, the number of these spots must have been small amongst all patients.

We cannot more clearly illustrate the symptoms occurring in the cases which terminated in recovery than by presenting two or three cases as examples. The last of these three patients has just recovered, (April, 1837,) and offers one of a series of sporadic cases of fever from time to time admitted into the hospital. They all originated in the house, and the subjects of the disease were in previous good health when exposed to the cause of the fever.

CASE VII.—Dr. F., one of the house physicians at the hospital, had been extremely devoted to his duties, and had spent much time in the ward in which many of the fever patients had been placed. At the time of his attack, the patients were in a great measure concentrated in this single ward. Dr. F. had resided in the house but a short time, and was of a full robust habit of body and in excellent health.

About the first of July, 1836, he found himself growing gradually weaker and appetite declining; but although he was sensible of a general feeling of uneasiness, he had no local pain except a dull, deep-seated aching in the centre of the forehead. There was no disturbance of any of the digestive functions. On the 7th he felt better, and took much exercise, in the hope of escaping any serious illness.

On the 8th he went through his usual duties in the morning, but while in the ward, he was seized with a chill and nausea. These symptoms he referred to a furuncle situated on the right hand, between the finger and thumb. On the 9th, complained of cephalalgia, uneasiness at the stomach, and fever; he applied a poultice to his thumb, and took ten grains of calomel and one grain of ipecacuanha. Nausea and vomiting came on in an hour, and after drinking freely of warm water, he threw up a quantity of greenish bile. The next day he took a Seidlitz powder, which was followed by five evacuations. In the evening he attempted to resume his duties, but, from feebleness,

discontinued them. From the 9th to the 14th the fever diminished every morning, but increased towards evening, so as to induce the patient to believe that he was attacked with ordinary remittent. He took the effervescing draught, and lived on light farinaceous diet.

14th. Restless during the night; almost no sleep; vomiting in the morning, but without pain. At 2, P. M., the pulse was full and rather forcible; skin hot and dry; tongue slightly furred; eyes injected; agitation and expression of general malaise. 20 leeches were applied to the abdomen, followed by fomentations; the punctures bled until the next morning. Neutral mixture, \mathfrak{z} ss. q. sec. h. cum ant. tart. gr. $\frac{1}{24}$. In the evening felt better, but was very weak; no pain. Pulse 96, compressible, but of moderate volume. Skin hot and dry. Bowels open frequently during the day; had six watery stools, without pain. The diarrhœa ceased after an injection containing thirty drops of laudanum. A few rose coloured spots, slightly elevated and disappearing on pressure, were scattered over the abdomen.

15th. Slept well; no cephalalgia, but dizziness on rising. Eyes suffused; no tinnitus or deafness; countenance anxious. Anorexia; one dejection. Tongue clammy, pale, coated with a whitish fur; thirst, dryness of the fauces and fœtor of the breath; a similar odour, but less marked, exhales from the skin; short, dry cough. Pulse 98; skin hot and dry; numerous spots of a light red colour, some slightly elevated and others on a level with the skin, disappear on pressure, and are scattered over the abdomen and extremities. Spt. mindereri. \mathfrak{z} ss. q. sec. h. Effervescing draught. Sponge surface with diluted solution of chloride of soda. Chloride of lime around the bed.

16th. Sleep disturbed by frightful dreams; same condition of the senses; intelligence and memory enfeebled. Eyes still suffused; purple flush of the face; less anorexia; tongue and thirst as yesterday. Abdomen a little tympanitic. Skin hot, but scarcely pungent. Petechiæ more numerous and of a more decided purple tinge than yesterday. Pulse 100, as yesterday. No stool until an enema containing a little chloride of lime was administered, when some consistent fæces were discharged. Urine reddish, cloudy. Same treatment; gruel.

17th. The petechiæ were larger and more livid on the arms. No sudamina or rose-coloured spots. Extreme prostration; anxious, dull expression of countenance; dizziness of sight; sensibility of skin natural; delirium and insomnia. Pulse 112. Sponge with the solution every hour. Poultice, with solution of chloride of soda, to the abdomen; other treatment as before. During the next night he slept none,

was very restless and delirious, and complained of much cephalalgia; cold applications were made to the head, sinapisms applied to the ankles, and gr. $\frac{1}{8}$ of sulph. morph. given by one of his friends.

On the 18th the injection of the eyes and dulness of intellect had slightly increased, but he had slept for some hours after the morphia. Same treatment, adding two cold enemata.

19th. Petechiæ fading; skin less hot. Pulse 120, moderate volume. Memory more correct; abdominal functions natural; burning sensation at the stomach, after taking the acetate of ammonia. Substitute effervescing draught, and cold enema every three hours.

On the 20th, diarrhœa checked by an opiate enema. Mineral water instead of previous medicine. The skin had become more moist. Pulse less frequent.

On the 20th the pulse had fallen to 84 in the minute; the petechiæ finally disappeared, and the countenance assumed that haggard, wan appearance which succeeds the fever. The patient asks for food, which was now granted, with a little wine, and a few grains of the sulphate of quinine daily. The fever did not again return, although there was a slight diarrhœa; and after the convalescence was fairly established, a small but painful abscess formed in the perineum.

Remarks.—The duration of this case was nineteen days, from the beginning of the fever until convalescence. At the same time that Dr. F. was ill, we had another patient, an assistant in the ward, who was taken while in perfect health. The latter patient was treated more actively. One of the house physicians bled him largely before the fever had attained its maximum, and some local depletion was used. Still the case was more protracted and more severe than that of Dr. F. I do not mean to assert that the depletion aggravated the disease, but only that it was powerless in checking its progress. The cephalalgia, which was intense in the case alluded to, was relieved by the bleeding; but, judging from our experience, a less copious abstraction of blood, by means of a few cups applied to the nucha, would have answered the same purpose just as well, without diminishing the strength of the patient. There was no depletory treatment pursued in the case of Dr. F., with the exception of twenty leeches to the epigastrium, which he applied very early in the disease.

One of the peculiarities of case VII. was the unusually offensive odour exhaled from the skin. It was much more marked than in most of our cases; and although the patient was placed in a large and well ventilated chamber, the smell of the perspiration was extremely fœtid until the chlorides were most liberally used in different parts

of the room, in addition to sponging the surface. There was complete loss of recollection.

After the patient recovered, he retained no consciousness of any thing that had occurred subsequently to the first four or five days of his illness. The emaciation was very slight, until convalescence began. It probably did not occur before, from the capillary injection of the face. The skin became pale and sallow when the emaciation was decided.

Although no remedies which we prescribed had any effect in interrupting the course of the disease, still some of the results we obtained from them were both positive and gratifying. The sponging with the solution of the chloride of soda diminished the heat of the skin and lessened the fœtor; perhaps it counteracted the contagious power of the disease. The diarrhœa was controlled by a small quantity of laudanum, which was given so cautiously as not to render the cerebral symptoms materially worse, or to suppress entirely the evacuation from the bowels. But the greatest benefit was derived from the quinine and other tonics, which were given just as the fever ceased. The purgative which Dr. F. had taken at the beginning of the fever seemed to have no influence beyond its immediate operation.

The colleague of Dr. F., who was exposed to the contagion of the same ward, was likewise ill with the typhus, but in a very mild form. He had the petechiæ, the prostration, wandering intellect, and other symptoms, but all so mildly as to require little special treatment. I subjoin his case as an example of the slight varieties of the disease. It is, however, characteristic, and cannot be confounded with dothi-enteritis.

CASE VIII. Dr. J., one of the resident physicians, had been indisposed for three days before the attack was decided. In the morning he felt nearly well, except a slight languor, which did not prevent him from taking more than his usual amount of exercise. In the evening his appetite failed him, and there was some nausea. On the 6th of August he returned from town with increased fever, cephalalgia, pain in the back and limbs, hot, dry skin, and pulse of moderate volume and force. There was a white coat upon the tongue, anorexia, but no nausea or disturbance of the senses.

He took a few grains of blue pill, followed by rhubarb, the effervescing draught, ice water, cold applications to the head, foot-bath.

7th. Slept at intervals through the night. Cephalalgia continues, but the memory and intelligence are both natural. Senses undisturbed, but countenance dull. Pulse 85, smaller and weaker than on the 6th. Tongue moist, with a whitish fur. Some thirst, no de-

sire for food, constipation. Skin hot, dry, no well marked eruption. In the evening there was an increase of headache; pulse 64, irregular. A Seidlitz powder was given, which produced two evacuations; sinapisms were applied to the feet, and the cephalalgia diminished.

8th. Some irregular petechiæ on the abdomen and limbs. Skin generally a little injected, especially the face. Suffusion of the eyes, but senses nearly natural. Fœtor of perspiration distinct but moderate. Skin pungent, at intervals intensely hot. Insomnia, a little delirium in the night. Intelligence apparently but little impaired, still he is unable to reason on any subject, and cannot form a legible letter; but the prostration of strength does not materially extend to the larger muscles. Tongue moist, rosy. Although he has no appetite the thirst is slight. Abdomen a little tympanitic; no cough. Fomentations to the abdomen; sponging with the diluted chloride of soda; effervescing draught; gruel.

The pulse afterwards never rose above 80. The petechiæ disappeared completely on the 12th or 13th. Some subsultus for two or three days. No diarrhœa; return of appetite on the 14th; and on the 18th he was sufficiently well to commence a journey.

Remarks. During the whole of this case the countenance and the state of mind of the patient resembled the effect produced by an over dose of some of the narcotics; or as Dr. J. afterwards stated, it seemed to him that he was partially intoxicated. Combined with this peculiarity there was a constant effort on the part of the patient to disguise his symptoms, and affirm that he was perfectly well. This case could not have been mistaken for one of typhoid fever, because in a mild case of dothineritis we never observe such a marked preponderance of cerebral symptoms. When we add the eruption on the skin and the characteristic odour, the diagnosis becomes easy. Indeed these slight cases of typhus are quite as well marked as the more severe examples, and there is but little chance of erroneous judgment.

The next case illustrates the character which the fever assumed when no longer epidemic. It was still a dangerous disease, but in general was easily cured by placing the patient under favourable hygienic circumstances, aided by an appropriate plan of treatment.

CASE IX. John ———, æt. 31, entered one of the medical wards on the 18th of April, 1837. He was employed as a nurse in the black ward for three weeks before his illness, although a white man. When attacked with the fever he was in good health and of temperate habits. For some years he has had no illness, except the venereal disease. On the 11th or 12th of April, felt unwell with cephalalgia,

dizziness, tinnitus in both ears, and confusion of sight. He had no chills nor pains in the loins. On the 13th felt extremely prostrated, but continued his work. No new phenomena appeared until the 15th, when, in addition to other symptoms, he had fever, slight cough, insomnia and sweating. Two stools daily.

April 19th. The patient has reddish hair and complexion; face generally injected; eyes suffused; slight cephalalgia; strength rather better. Intelligence clear, but some delirium in the night. Sweat with pungent odour. Since the preceding day an eruption has appeared over the whole surface of the body; it is in dull red spots, scarcely elevated above the surface of the skin, not disappearing on pressure, and about the size of a flea-bite. No sudamina; tongue reddish, rather dry, slightly coated. Fauces of a bright shining red colour. No tympanitis, or pain in the abdomen; thirst; anorexia; two dejections. Pulse 112, soft, easily compressed. Respiration high, 30 in the minute. Expectoration of thin watery saliva. Posteriorly the percussion is resonant in both sides, but less in the right than in the left lung. The respiration was feeble throughout the right lung, with much mucous rhonchus. *Spt. mindereri, lemonade, gruel, sponging with solution of chloride of soda.*

On the 20th diarrhœa, with four stools daily. Muttering delirium and increase of stupor. Some subsultus at the wrist, and spasms of the muscles of the face. No change in other symptoms. *Same treatment with the effervescing draught. For diet, gruel and a few spoonsful of beef tea.*

On the 21st the petechiæ were paler; the larger ones which at first resembled rose-coloured spots were now of a dull livid colour. Five dejections; pulse 120, soft, and compressible. Intelligence more clear since dry cups were applied to the nucha on the previous evening.

The intelligence and the pulse, as well as most symptoms, were not increased in severity until the 24th. The patient then became more dull; constant somnolence. Tongue dry, brownish, chapped, but not furred. The diarrhœa has ceased since two enemata given on the 23d, containing each ten drops of landanum. Pulse 104, soft and trembling. Petechiæ very feeble. Soda water was substituted for the effervescing draught; and four ounces of wine made into whey were added to the other prescriptions.

On the 25th the appetite was better, and although there was a slight return of diarrhœa the other symptoms continued to improve. The pulse had fallen to 85 and 90 on the 26th, but there was no improvement in the cerebral symptoms. The tongue was very red and smooth,

cleaning in irregular patches. In addition to his other prescription, ten drops of the oil of turpentine were given every two hours. The next day there was a marked improvement of the intellect, with increased appetite. The pulse was 76, and soft. There were two or three stools daily, although the patient was decidedly convalescent. A few grains of sulphate of quinine were substituted for the other remedies on the 28th, and on the 3d of May the patient had regained his strength sufficiently to walk about the ward.

The duration of this case was but fourteen days, decidedly less than the average. It was treated as all ordinary cases were managed; no prescription of a more active nature than the *spiritus mindereri* and sponging with the solution of the chloride of soda was either requisite or appropriate until the accidental symptoms became sufficiently severe to demand a special treatment. Thus the diarrhœa was readily checked by the administration of a small dose of opium in enema, and did not return except in a slight degree.

The laudanum was given in a minimum dose, only ten drops in each enema: this was a precaution adopted to avoid increasing the cerebral symptoms by the narcotic effect of the opium, and the too sudden depression of the diarrhœa. Still there was a temporary increase of the stupor.

The spirits of turpentine were used with evident advantage; this remedy is administered at this stage of fever, when the tongue begins to clean, but is still smooth and shining, by Dr. Wood of this city.

Both this case and that of Dr. F. were complicated with diarrhœa. The occurrence of this symptom afforded an additional reason for their publication. Notwithstanding diarrhœa is so frequent in dothi-enteritis, and when combined with the cerebral symptoms furnishes one of the most important differential characters, still in these cases of typhus, the peculiar eruption, the odour of the skin, and the intense cerebral symptoms removed all doubts.

Diagnosis.—We now approach an important and, in some respects, the most intricate part of our subject. The questions to be solved are, 1st. Whether there exists any essential diagnostic character between the typhus fever we are describing, and the typhoid fever of Paris, which is also not infrequent in America. 2nd. If the diagnosis between typhus and certain autumnal remittent fevers attended with extreme prostration, and other typhoid symptoms, be evident. Under the term typhoid we include various nervous symptoms detailed in the preceding pages, including the prostration and dulness of intellect. We of course use the term at present in its popular signification; and although it does not possess the greatest precision, still it is consecrated

by long usage, and it would be almost impossible to substitute another epithet equally expressive.

By diagnosis we mean the *comparison* of all the symptoms appreciable by us in disease. This comparison requires a careful examination of the symptoms presented during life, and of the phenomena observed after death, in such cases as terminate unfavourably. We do not base our classification of diseases solely upon their anatomical lesions, although these lesions are oftentimes more constant than any other single symptom whatever; but we group together lesions and symptoms whenever they occur together with sufficient frequency to admit this process of generalization.

In accordance with this signification of diagnosis, we admit the existence of phthisis previously to the formation of tuberculous matter in the same manner as we conceive the possibility of typhoid fever occurring without the characteristic lesion which gives to it the name dothi-enteritis.

It is not only necessary to compare the symptoms and the pathological phenomena, but also to examine the succession of the symptoms and their relative intensity at different periods of the disease. It is necessary to attend to this order of symptoms even in those diseases in which, from the developement of the local signs, the diagnosis is easy, but in fevers about which so much confusion has existed, as in typhus fever, the most careful observation of all the points is absolutely essential. When we attempt to disentangle this confusion we must group our symptoms, and inquire if one series occurs in a sufficient number of cases for us to admit the succession of the phenomena as nearly, if not quite, constant. If this series does occur in the large majority of cases, the symptoms offer a relation which is sufficiently constant for us to admit them as constituting a distinct disease. If the most important symptoms be present, the absence of one or two, or even a large number of them, does not materially impair the diagnosis; nor does the accidental presence of some irregular symptom which is not usually met with, and does not form a link of the chain, render it uncertain.

We are the more desirous of insisting upon this distinction, as the remarks we made relative to this subject have evidently been misunderstood. The writer to whom we allude supposes that we limit the distinctive characters of the continued fevers purely to their anatomical lesions. We certainly desire to take a more extensive ground; and, from the examination of a large number of facts, we are fully convinced that a set of symptoms which characterize typhoid fever or dothi-enteritis, are connected with a lesion of the glands of Peyer.

We have met with no exception; and the cases in which the symptoms are said to have been present without the lesion, are confessedly so few in number as to render them doubtful. At most, they prove only that the fever may pass in some rare instances through its course without its anatomical signs being developed. In the same manner tuberculous fever occasionally proves fatal before the deposit of the morbid substance from which its name is derived. Now this same lesion of the intestines is certainly so uncommon in other fevers, that at Philadelphia, out of eighteen or twenty cases of malignant remittent, and at least fifty of typhus, I have seen but one example in which the glands of the small intestine were at all affected, although they were always examined with scrupulous care. Even in that solitary instance the lesion was slight, confined to the mucous coat, and did not extend to the cellular substance, as in dothineritis.

On considering the symptoms of typhus and typhoid fevers, we observe that the latter disease is not confined to any particular season; it commonly attacks individuals of a particular age, and exposed to some unaccustomed mode of life. It sometimes occurs at the same time that an epidemic of autumnal remittent or of typhus exists. I have seen it under both these circumstances, but I have always observed symptoms which distinguished it from either. There could be no doubt of the correctness of the diagnosis, for it was not made in private practice, but in hospitals, where there were always a number of physicians and pupils present to correct and verify the facts.

These remarks are designed to show that the distinctive characters of these fevers are not such as in practice to allow them to be confounded together. Nor was it very difficult to acquire this facility of diagnosis, as all the better instructed students easily attained it. That the very early stages of typhus and typhoid fevers resemble each other is true, but in no greater degree than in the early stages of typhoid fever and small-pox, which I have known to be mistaken for each other by the most experienced observers. When the initial period of the fever is passed, the disease may be readily distinguished. Even very early, before the fever assumes its characteristic appearance, there is usually some fact which may throw light upon its nature.

1. Dothineritis is usually a sporadic disease, although it sometimes appears as a wide-spread epidemic. In the latter case the symptoms are so well marked, that these are never doubtful, except in a few of the earliest examples. Now, typhus is very rarely sporadic, and if scattering cases do occur, they are generally connected with an epidemic and follow it, as scattering cases of cholera were observed for a long time after the great epidemic of 1832.

2. Typhus is evidently very contagious; in the epidemic of 1836 it was quite as contagious as small-pox. I am fully convinced of its contagious nature from extensive observation as a physician to the hospital, and from the official visits and inquiries which I made as a member of the Board of Health. Dothineritis is certainly not contagious under ordinary circumstances, although in some epidemics we have strong reason to believe that it becomes so. It bears in this respect the same relation to typhus fever that measles does to small-pox.

3. The initial symptoms of the two affections chiefly differ in the greater stupor, dulness and prostration of typhus, which are in strong contrast to the moderate cephalalgia and disturbance of the senses in dothineritis.

Still there are now and then, perhaps once in twenty or thirty cases, some symptoms which are apparently common to the two forms of fever. Just as in the diagnosis of measles and scarlatina there is usually no difficulty, but we sometimes see cases of a hybrid character in which the most experienced physicians may be doubtful. In two or three cases out of three hundred the symptoms of typhus and typhoid fever seemed blended together; but these were slight forms of disease, which are necessarily less distinct than those of a more severe type. In practice, such cases are too rare to give rise to any difficulty.

The more severe cases of dothineritis sometimes resemble typhus fever very closely, but the resemblance is confined to the symptoms offered by the patient in the most aggravated period of the disease, and does not extend to the succession of symptoms. Indeed, if these cases of typhoid fever are examined at the early stages of the disease, they are certainly more characteristic than the slighter varieties; and although the symptoms occurring during a single day would lead us into error, the comparison of the successive changes will always guide us.

When the disease is completely formed, the characters on which the distinction between the two forms of fevers rest, are: 1. The suffusion of the eyes, which occurs in every case, or nearly every case of typhus fever, with the dusky-red aspect of the countenance. 2. The extreme stupor and inactivity of the mind even when positive delirium does not exist. 3. We also observe in typhus no constant abdominal symptom, and at first merely dulness on percussion and feebleness of respiration at the posterior surface of the lungs. 4. If to these symptoms be added the peculiar eruption of petechiæ, which is scarcely ever absent in whites, there remains hardly a possibility

of error. In the typhoid fever we consider as distinctive characters, the prostration, the somnolence, the slow developement of nervous symptoms, which are not so strongly marked as in typhus. The abdominal symptoms are tympanitis, pains in the abdomen, and diarrhœa. The sibilant rhonchus is heard in the chest; and lastly, there is an eruption of rose-coloured papulæ and sudamina upon the skin.

It is not necessary to insist upon the diagnosis between typhus and the ordinary autumnal remittents. The peculiar season at which these latter diseases originate, their progress and termination, all differ too widely from the symptoms of typhus to allow of error, without extreme inaccuracy of observation.

Some rare cases of pneumonia, especially when they occur in drunkards or patients whose constitution is enfeebled from other causes, resemble typhus in many particulars. Indeed the diagnosis is vastly difficult, were it not for the petechial eruption, as the stupor is sometimes considerable, and the suffusion of the face and eyes nearly as great as in typhus. If in these cases we are totally without knowledge of the early circumstances, we may occasionally mistake a case of pneumonia for typhus fever. But we could scarcely confound the pneumonia, which appears as a mere complication in typhus, with the original inflammation of the lungs. In some of these cases we derive less benefit than we could anticipate from the physical signs, because pneumonia may be present and be readily distinguished by auscultation, but at the same time be strictly secondary. Neither bronchitis nor angina resemble typhus, unless they occur as an epidemic.

Prognosis.—We inferred with considerable certainty that a patient would recover who was admitted at the early stages of the affection, and whose constitution was not broken down by previous diseases or excesses. The event generally justified this opinion, as the results of the treatment will prove. Typhus, therefore, is not a very mortal disorder, although always dangerous. It is scarcely more fatal than dothinententeritis or pneumonia. When the stupor was extreme, so severe as almost to amount to coma, the prognosis was nearly always fatal; but if the stupor could be diminished, although only for a short time, by rousing the patient or addressing him in a loud tone of voice, the fever might be expected to terminate favourably. We could not trace a close connexion between the degree of subsultus, or the alteration of the senses or sensibility, and the danger of the disease. The affection of the lungs was generally moderate, and was therefore omitted in our calculations; still, decided pneumonia became a grave complication, and evidently proved fatal to one of our patients. The prognosis was extremely unfavourable if the prostration, which is so

frequent in the latter stages of the disease, happened to occur at the beginning, or during its course, before the complete abatement of the fever.

The prognosis was different at various periods of the epidemic. The same rule extended to typhus as to cholera, and other epidemics of malignant disease. At the beginning the cerebral symptoms were more violent than they were afterwards, and our prognosis was grave, in accordance with the great mortality which then occurred. But afterwards, when the fever was less extended, it also became a less mortal disease, and we anticipated the recovery of the patient in nearly every case. This rule of prognosis should therefore not be overlooked by those who may witness similar epidemics; if they are limited and short, the success of treatment will seem very great; but if their form be more violent, a fatal termination may be expected in a considerable proportion of patients.

Treatment.—We are now approaching a most important part of our subject, which includes many different questions. For therapeutics, far from being the most easily settled of those points in medicine which may seem doubtful, is more encompassed with difficulties than any subject connected with the science. After the most patient and candid investigation, pursued without the smallest desire of promulgating any opinion which has not been fully sanctioned, a positive conclusion is frequently not attained; and if such difficulties are experienced by men who are familiar with the history of disease and accustomed to the action of remedies, what shall we think of the pretender who dabbles in these matters without a knowledge of the diseased actions, and still less of the modifications which remedies may cause in the economy? We are therefore doubtful of the results which promise the most success, and we utterly reject all statements not based upon the foundation of close observation and sacred adherence to truth.

To examine our cases with the slightest prospect of attaining any important results, it is necessary to propose two distinct questions. *First*, what has been the effect of a particular remedy or plan of treatment in diminishing the mortality, shortening the duration or mitigating the severity of the disease, considered as a whole. *Secondly*, we must inquire what influence individual remedies may have in diminishing the violence of certain symptoms which increase the danger and the suffering of the patient.

The first question is always of difficult solution, especially with regard to the exanthemata, and typhus and typhoid fevers; all of which seem to run a determinate course. After the disease is formed, this

course cannot be much shortened by art. The materials we possess will not prove sufficient to clear up this matter; complete and accurate results could not possibly be attained, unless the epidemic should again return with equal intensity. The different periods of the epidemic offer such a variety in degree, that we cannot with entire accuracy appreciate the effect of remedies upon the course and termination of the disease; but we can approximate to the truth more or less nearly, and must be governed by probabilities. If the epidemic of typhus should reappear, physicians might readily obtain the solution of most of the therapeutic problems which would arise; but they should begin with a definite knowledge of the peculiarities of the disease, and of the effects of the course of treatment already pursued.

The second question is a more simple one, although we regard it as scarcely less important. Until we discover some means by which our power of arresting or diminishing the intensity of morbid phenomena is vastly increased, we shall probably be compelled to resort to such remedies as diminish the severity of particular symptoms, and thereby materially increase the comfort of the patient. In some instances even more important effects may be produced by these remedies; for, although the intensity of the diseased action attendant upon fever or other general diseases may not be sufficient to destroy the patient, he may still fall a victim to the prostration produced by excessive secretions, or he may die from the functional disorder of particular organs. By watchfulness, and by checking the symptoms, such a termination may often be avoided.

Besides these points of treatment, we should observe some general precautions which are more or less applicable to most cases of disease, but are especially requisite in typhus fever. These precautions are chiefly of a hygienic character; and as their utility is not questionable, we may begin with them.

1. That typhus is clearly a contagious disease, was fully proven in the epidemic of 1836 at Philadelphia. Its contagious property is also admitted by most authors who have accurately observed the same disease. We must therefore immediately take precautions for the complete separation of typhus patients from those affected with other diseases. If the number of typhus cases be small, these precautions need not be so strictly enforced; and may be limited to the free ventilation of the ward and the preservation of absolute cleanliness. The contagious principle does not extend far from the individual, and is readily dissipated by free ventilation. The chlorides of lime and soda were used freely about the bed of the patient; and although they certainly did not prove substitutes for fresh air, they were useful,

and the chlorine in a great degree neutralized the offensive exhalation from the patients. We need not add that the friends of the patient should be excluded from his apartment, except as many as may be required for the necessary services to the sick. This exclusion is necessary to prevent the propagation of the disease, and preserve the air of the room in purity.

In practice we should remember these precautions; and although at the time, typhus may not exist, practitioners throughout the country should recollect this necessity. For partial epidemics of petechial typhus will undoubtedly again occur; and if they are not managed with the necessary care, the disease may extend to a large number of patients who would otherwise have escaped. We are the more earnest in calling the attention of the profession to this subject, as the disputes relative to the contagion of yellow fever has certainly unsettled the minds of many physicians on the subject of contagion in febrile diseases. But as we possess clear demonstrative evidence of the direct contagion of petechial typhus, it would be both absurd and criminal to neglect the appropriate hygienic measures.*

2. Of the influence of particular remedies upon the general course of the disease, and on individual symptoms.

Blood-letting was not employed, except by cups, in the immense majority of our patients. We abstained from it at the beginning of the epidemic, because our patients all entered at an advanced period of the disease, when it was totally unnecessary, and, from their extreme prostration, would probably have been destructive. About the middle and latter period of the epidemic many individuals engaged in various duties in the hospital, who were previously in perfect health, were taken ill with the fever, and afforded us an opportunity of testing the effect of blood-letting. It did not avert the fever in a single case. Indeed the patient who was bled most largely, (℥xx.) on the second or third day, had a protracted and severe attack of the fever. He was a nurse, in very good health, and therefore offered a favourable case for this treatment. At an earlier period of the epidemic we had also used blood-letting in a stout mulatto, taken ill in the hospital, where he was under treatment for a slight venereal disease. I was present at the bleeding, and found that he fainted after the abstraction of five or six ounces. The blood was dark and soft. This patient died. A third patient, who entered on the third day of the

* A pupil of mine, from North Carolina, informed me that he had witnessed a similar fever amongst the negroes. It seemed to be contagious; and from the absolute disregard of cleanliness and the crowded state of the negro cabins, it frequently spread extensively.

disease, was bled to faintness, ($\frac{2}{3}$ xvj.) he was relieved of his headache, and in some degree of the stupor. But headache and the more intense cerebral symptoms, as stupor and delirium, returned, and the patient was not convalescent until the 26th day. A fourth patient, in whom the fever was complicated with bronchitis, was bled on the seventh day, and again on the 9th, besides one or two applications of cups. The bronchitis seemed benefitted and the cerebral symptoms diminished, but returned the next day as severely as before. We did not resort to bleeding in many cases occurring amongst the men, as the number of admissions at the beginning of the disease was not very great, and we always regarded the advanced state of the fever, or extreme prostration of the patient at the commencement, as sufficient reasons for abstaining from venesection.

The general results obtained from bleeding in the cases of women, differed but little from those observed in the men's wards. Bleeding never arrested the disease; nor did it apparently abridge its course. There is another fact which should make us the less anxious to resort to blood-letting in most cases. It was practicable only when the disease was of slight or moderate severity. The more violent cases were all attended with extreme prostration, so that the patients were exhausted after very small abstractions of blood.

The advantages of blood-letting were these. In the earliest stages, that is, before the eruption of the petechiæ, there was usually diminution of the cephalalgia, of the disturbance of the nervous system, and of the general feeling of uneasiness experienced by the patient. But the pulse was slightly affected, and the influence of the bleeding upon the heat and dryness of the skin was not very great. Now these advantages are sufficient to induce us to admit the utility of venesection in cases of typhus fever which presented a force and frequency of pulse above the average, and symptoms of cerebral or thoracic inflammation, if they are seen by the physician during the course of the first week. After that period blood-letting becomes a doubtful remedy, and, as a general rule, should be abandoned. Venesection is inadmissible from the very beginning in individuals who react with difficulty, and seem prostrated by the direct impression of the disease.

We are not yet satisfied as to the power of blood-letting in preventing the formation of those internal congestions which are so frequent in the latter stages of typhus. This explanation of its utility, which is given by some of the British practitioners, appears to depend more on theory than on practical observation.

Local blood-letting is obviously free from many of the disadvantages of venesection. As in most cases but a few ounces of blood are

taken, it produces but little exhaustion, and may therefore be prescribed without hesitation in many cases in which general bleeding is inadmissible. Still copious local bleeding will greatly enfeeble patients, and should not be resorted to, unless there is a reasonable prospect of advantage. We consider it as a remedy of considerable utility, as in a majority of cases the patients were decidedly relieved after cups to the nucha. The cupping was most efficacious when directed in the earlier period of the disease; it was nearly without effect in the middle stage, and was positively injurious when the fever began to decline.

Dry cups were used during the epidemic still more frequently than the scarified. They were at first applied to the nucha, and afterwards were often placed upon different parts of the spine, especially between the shoulders. We were at first disposed to undervalue them; but as we never observed any bad effects, except the fatigue they necessarily caused, we afterwards used them less rarely, and considered dry cupping as one of our most frequent prescriptions. The dry cups were applied when the stupor and injection of the eyes were well marked, although the excitement of the pulse was moderate or below the natural standard. The stupor was evidently lessened after the cupping in at least half the cases, and the effect seemed to a certain extent beneficial in about one half the remainder. The nervous symptoms, as subsultus and insomnia, were materially diminished after the cups in nearly every instance. At times, this diminution was temporary, and in a short time the symptoms returned to their former intensity. But in other cases the sleep became sound, and the subsultus ceased for a number of hours.

Dry cups, applied in considerable numbers, and left upon the nape of the neck and between the shoulders for twenty minutes or half an hour, has always seemed to me a more powerful remedy in nervous functional derangement not attended with inflammation, than scarified cups. I have used them largely in the treatment of the apoplectic symptoms of malignant intermittent with the best effects, and resort to them with confidence as one of our most powerful means of controlling disordered nervous action.

Blisters to the nucha were used during the height of the epidemic in a considerable number of patients. In a few cases blisters were also applied to the thighs, but it was chiefly in desperate cases where no treatment could avail much. The effects of blisters to the back of the neck were an obvious diminution of the cerebral symptoms in only one case in six, a doubtful influence upon them in two, and in the remaining three they were nugatory. No increase of cerebral symptoms followed the blisters in any case. Sloughing never occurred,

although it is frequent in dothinenenteritis; and the blistered surface very rarely became ulcerated, or offered any peculiar appearance. From these meagre results we would infer that blisters are scarcely to be ranked among the remedies of petechial typhus.

Sinapisms were a more efficient remedy than blisters. They were of great and undoubted advantage in the stage of prostration which occurs at the decline of the fever, and certainly contributed to save the lives of several of our patients. We also found them useful in diminishing the stupor and prostration during the disease, as well as in reanimating the strength of the patients who were brought to the hospital, exhausted from neglect and a fatiguing ride from a distant part of the town. But if the fever was high and the heat of the skin considerable, sinapisms were vastly less effectual than when the skin was cool, and the patient seemed sinking from mere exhaustion.

Stimulating liniments, as the spirits of turpentine, alone, or combined with soap liniment, or with the decoction of cantharides, were used in particular states of the system only. We found them beneficial at the period of prostration, after the fever had subsided, and occasionally continued their application for several hours. These liniments were also applied when the patients were much exhausted from the fatigue of their journey. In the majority of cases they were neither necessary nor indicated.

Dry heat, by means of warm sand, bran, &c., was directed whenever the temperature of the extremities sank much below the normal standard; it was designed simply to effect a temporary purpose.

Sponging with tepid or cool water was a remedy adopted very early in the epidemic, and was more constantly directed after experience had convinced us of its great utility. We occasionally added the chlorides or some of the alkalies to the water, for purposes already mentioned, but most frequently we used pure water. The water was applied cold, when the temperature of the surface was above the natural heat of the body, and at the same time was dry; but if a slight perspiration had commenced, it was always more prudent to employ a warmer water, as we are accustomed to do in other febrile diseases. We found that by frequent sponging we could regulate the heat of the surface with great ease, and in some degree could moderate the cerebral symptoms.

Cold cloths were applied to the head, or even pounded ice, but with no influence upon the disease, and very little upon the delirium, except when it was noisy and incoherent, as it is in ordinary inflammatory affections of the membranes of the brain. In such cases the application of cold was useful, and occasionally suspended the symp-

toms. The cephalalgia, when intense, was very generally diminished after the use of this remedy, and a constant insomnia was replaced by sound and refreshing sleep.

The influence of internal remedies is more difficult to appreciate than that of external treatment, and their effects upon the general course of the disease are involved in so much obscurity, that we cannot venture to attempt an accurate analysis of them. The reader will, no doubt, in great part, agree with us that in a disease of this nature, we cannot hope that remedies should be able to effect a sudden change in the morbid actions, and a restoration to health, after it is once completely formed.

Emetics. These remedies are recommended by many authors at the commencement of severe epidemic diseases. We used them in a large number of cases. It was not with the intention of removing a morbid secretion or of acting upon the liver, for both stomach and liver were in a state of perfect integrity; but we hoped to produce a shock which might change the morbid actions of the economy, and thus check the fever. With this view an emetic of ipecacuanha was given to several patients at the very commencement of the fever, before the eruption of petechiæ, and even before much stupor occurred; in no instance were we convinced that the disease was cut short. It is true that amongst the patients thus treated there were two or three slight cases, in which the fever was not completely developed, but such attacks occur with and without the emetic treatment; and amongst the whole series of cases treated in this manner, there were several which were excessively severe. From these doubtful effects of the emetic treatment, we would hesitate as to its use; still, if the case should be slight, and any reason should exist for giving an emetic, there is no objection to the ipecacuanha. In severe fever it might be dangerous.

Purgatives are remedies so much in vogue with British and American practitioners, that we may readily imagine that they would be administered in typhus fever. When I visited Edinburgh in 1831, saline purgatives, with tartarized antimony, were the common medicines given in an epidemic of fever, which, I believe, was mild petechial typhus. We administered purgatives in the epidemic of 1836, and although they seemed to relieve some unpleasant feelings of the abdomen, if the patients were purged very early in the disease, there was never any immediate cessation of symptoms, or even a well-marked diminution of the disorder of the cerebral or abdominal organs. We did not persevere in their employment, so that we cannot state what was evidently their effect; but in a general way we can

say that they seem to us to be classed amongst the doubtful remedies, which may be used in future epidemics, if no express contraindication should exist. We are well aware of the great importance attached to purgatives in fevers of this kind, and we do not deny that they may have been most useful in the hands of many practitioners; we only state that in our hands they were not so useful as to justify us in classing them amongst the remedies of undoubted power. They are harmless in the earlier stages of the disease, when the strength of the patient is not much exhausted.

Diaphoretics were used by us habitually. We were influenced by two reasons; one, to relieve the heat of the skin by perspiration, and another because these remedies from their comparative feeble powers, are appropriately given at that period of the disease when we are in doubt whether to act or to trust the cure entirely to the efforts of nature. We used various diaphoretics, the effervescing draught, the neutral mixture, and still more frequently the acetate of ammonia. These remedies never produced other inconvenience than a slight catharsis in a few cases. The acetate of ammonia very rarely acted as a laxative, while it possesses mild stimulating powers, and is therefore one of the most appropriate of the class. From the very nature of these remedies it is difficult to ascertain if they possessed much power over the disease: speaking from our general impressions we should state that they diminished the intensity of the fever, and concurred with the sponging in reducing the temperature. From these probable advantages, added to their freedom from deleterious properties, we employed them in a large majority of our cases.

Tonics were used by us in many stages of the disease. They were of undoubted and great utility towards the latter period of the fever, when the pulse fell in frequency and force, and the heat of the skin diminished. Our notes generally agree in this respect, and prove that tonics not only exercised a gradual and permanent influence upon the appetite and strength of the patient, but that they produced an immediate impression. The improvement was sometimes so rapid, that it was very obvious from one day to the next, and frequently produced a decided increase of strength and appetite. We are convinced that the good resulting to our patients from this class of remedies was amongst the most gratifying results of our treatment. The patients who have just escaped the violence of the fever, require a supporting treatment, or the mortality amongst them will be very considerable.

The tonic most employed was the sulphate of quinine, given in solution; usually about twelve grains in twenty-four hours.

We preferred it for the obvious advantages of its small bulk, and easy solubility. Huxham's compound tincture of bark was recommended by Dr. Parrish as a good tonic for the earlier as well as the later stages of typhus fever. We used it in numerous cases, and were pleased with its effects; although there were certainly at times, some disadvantages following its employment. It was irritating to the stomach, and seemed occasionally to increase the fever. The infusion or decoction of cinchona, especially if acidulated with the elixir of vitriol, seems to us a very appropriate form of administration, although we employed it but rarely. The other vegetable tonics were occasionally directed, but their effects offered nothing peculiar.

Alcoholic preparations were employed very liberally at the beginning of the epidemic, more so than we afterwards thought necessary. This difference arose partly from the extreme prostration of the patients, who all entered at an advanced period of the disease, after much suffering from neglect and privation, partly from the greater depression of strength and of the powers of life which characterized the early periods of the epidemic; and in some measure we were influenced by the advice of practitioners who had witnessed previous epidemics of this nature at Philadelphia, and had found the stimulating practice most useful. The stimulant we usually employed was wine, rarely brandy; in a few cases porter was given. We find it difficult to estimate the precise effects of wine, during the middle periods of the disease, although the strength of the patients was evidently increased, and the muttering delirium diminished. At the early and at the latter stages of the fever there was no doubt as to the evident benefit derived from wine.

We used it in the early stage only under peculiar circumstances. When the patient was already in feeble health, the attack of typhus fever produced extreme prostration, and sometimes proved quickly fatal, without the development of the ordinary febrile reaction. These cases were similar to some varieties of measles, in which the eruption is indistinct; but the general symptoms are marked by extreme prostration. Under such circumstances wine was given with immense advantage, either simply diluted with water or made into whey.

In the latter stage of fever, wine, porter, and in a few cases even brandy, were given with much benefit. It is difficult to conceive the extreme prostration in which our patients were left after a severe attack of fever. The skin is usually cool and the pulse weak and fluttering, but there is still muttering delirium and great feebleness. Under these circumstances, wine, combined with quinine, and a nu-

trititious diet, produced an effect which was almost magical. The diet and tonics were essential in increasing the permanent strength of the patient, but the immediate benefit derived from the wine was much more obvious.

The quantity of wine given in twenty-four hours, varied from four to sixteen ounces. It was generally from six to eight ounces. Practitioners have remarked that a moderate dose of wine is capable of producing all the good effects which can result from it. In our observations a similar result was obtained, and we rarely exceeded eight ounces daily, except as a temporary prescription to obviate extreme prostration. The quantity given with that object was not limited, but was increased until the strength of the patient improved. The quality of the wine could not be much regarded in hospital practice, but in private life the strong and purer sherries are preferable. We observed no ill effects from the wine, in the earlier period of the epidemic; if any resulted, they were so blended with the symptoms that we could not separately examine them; but where the fever was higher and the prostration less, wine became less useful. We therefore restricted its employment to the periods of prostration, when it was indispensably necessary. The less stimulating diaphoretics were substituted with advantage during the middle periods of the fever. Our observations may account for the great discrepancy of opinion which exists amongst physicians as to the advantages resulting from the treatment of typhus fevers by the free use of wine. Those who recommend wine very early in the fever, have met with severe cases attended with extreme depression, and have almost always given wine with some advantage. If it did not in itself prove successful in entirely restoring the strength of the patient and arresting the disease, it produced a temporary abatement of some of the more prominent symptoms. It does no mischief except in those cases in which the circulation in the brain is extremely active or there is acute inflammation of the lungs. If care be taken to refrain from wine in the two last mentioned circumstances, no inconvenience will result from its use, and in many stages of typhus fever it will be found nearly indispensable.

The *diffusible stimulants*, as ether and Hoffman's anodyne, were used under particular circumstances, chiefly with a view to stimulate the circulation and enable the patient to recover from a temporary depression of strength. The Hoffman's anodyne was commonly given combined with acetate of ammonia. Some of these stimulants was directed as a frequent prescription.

The *carbonate of ammonia* is a remedy very frequently used in the

viously improper when there is much dulness of intellect, attended with great suffusion of the eyes and countenance.

The treatment which was usually pursued by us, may be learned from a study of the remedies already indicated; but as their separate examination tends to break up the connexion of this description, we will state in a few words what treatment we thought preferable under ordinary circumstances. At the beginning local blood-letting will diminish the cephalalgia or other local uneasiness which may chance to exist; general bleeding is to be used only as an occasional treatment: afterwards the patient should be kept upon a mild farinaceous diet, with a little animal broth. The heat of the surface is to be moderated by cool or tepid sponging, preferring a solution of chloride of soda to simple water. The effervescing draught and other mild beverages may be taken as a common drink, more stimulating diaphoretics if the strength of the patient should fail; wine and other stimulants should be given when the prostration is great; and quinine, with a concentrated diet, should be added when the fever subsides, and the skin becomes cool. Emetics, purgatives and blisters were found useful occasional prescriptions, adapted to the removal of particular states of the system, but did not answer our expectations as a general method of treatment.

The mortality amongst the cases which were treated by us from the beginning was not great; but the total loss of patients admitted at advanced periods of the disease, many of whom were moribund, was very considerable, about one in three. The best means of judging is to examine the mortality amongst the officers and servants of the house who happened to be taken with fever while in good or tolerable health. Of these patients two died, making about one in seven. Of the two who died one was paralytic, enfeebled and advanced in years; the other was a young woman in good health, but was affected at the beginning of the epidemic, when the disease was very severe, and our notions of the treatment were not so definite as they afterwards became. The case of this patient is reported in the first part of this article. The mortality is not then great, under favourable circumstances; but is very large when neglect, bad food, crowded apartments, a broken constitution, and above all, a severe form of the epidemic are combined.

The duration of this disease, after it was fully formed, varied from eleven to twenty-eight days. In a few cases it was protracted for a still longer time, but these cases were complicated with an accidental lesion, developed during the course of the fever, and lasting after the latter had completely disappeared. The average duration, exclu-

sive of the cases which terminated in death or in sloughing of the depending parts, or disease of the chest, was nineteen and a half days. About one half the cases terminated at or very near the twentieth day, (from 19th to 21st inclusive.) In the cases which lasted less than the average time, most of the patients were below the age of twenty years, so that youth not only diminishes the danger of typhus but shortens its duration. After twenty the duration of the disease did not seem to depend upon the age of the patient.

The duration of the cases which entered at an early period of the disease was less than that of those admitted after the first week. Whether the longer duration of the latter cases depended upon the want of care and previous bad treatment, or whether the cases admitted at the later periods of the fever were selected in consequence of their not recovering so rapidly as other patients, cannot be rigorously demonstrated. We believe much of the difference arose from the absence of medical attention and the necessary comforts of life, as many of these protracted cases were evidently slight, but they were nevertheless prolonged beyond the average duration.

The general conclusions with the respect to the power of treatment, are, that though it cannot cut short the petechial typhus after the disease is formed, it may shorten the duration, diminish the mortality, and mitigate the severity of the symptoms.

NOTE. We omitted mentioning in its proper place, that suppuration of the lymphatic glands was very rare—not exceeding one in a hundred cases.

ART. II. *An Experimental Examination into the opinions of Sir Charles Bell relative to the anatomical and physiological characters of the Spinal Marrow.* By HENRY H. SMITH, M. D., resident physician in the Pennsylvania Hospital.

Considering the great prevalence of neuralgic affections at the present day, and the importance of the spinal marrow to the general economy, it is a matter of surprise that its functions, character, and physical relations should have attracted so small a share of the attention of physiologists. Intimately connected with the brain, and sending large and important nerves to a great portion of the human body, its action ought most undoubtedly to be thoroughly understood, not only by the physiologist, but also by every one who attempts the cure of nervous diseases.